

We Claim:

1. A method for adjusting an electrical stimulus in a retinal implant, the method comprising:

converting light incident upon at least one photovoltaic element to generate the electrical stimulus at the retinal implant;

converting light incident upon at least one additional photovoltaic element to generate an additional electrical stimulus at the retinal implant; and

providing gain to the electrical stimulus with the additional electrical stimulus to provide a modified electrical stimulus.

2. The method of claim 1, further comprising:

applying the modified electrical stimulus to tissue adjacent the retinal implant.

3. The method of claim 1, wherein converting the light incident upon the at least one photovoltaic element and converting the light incident upon the at least one additional photovoltaic element further comprises converting a first wavelength portion of the light incident upon the at least one photovoltaic element and converting a second wavelength portion of the light incident upon the at least one additional photovoltaic element.

4. The method of claim 3, wherein the first wavelength portion and the second wavelength portion are substantially identical.

5. The method of claim 3, wherein the first wavelength portion and the second wavelength portion are substantially different.

6. The method of claim 1, wherein the light incident upon either of the at least one photovoltaic element and the at least one additional photovoltaic element is at least partially supplied by an external illumination system.

7. A method of adjusting a stimulus generated by a retinal implant, the method comprising:

providing a retinal implant comprising a first photovoltaic element and a second photovoltaic element, the second photovoltaic element being in electrical communication with the first photovoltaic element;

generating an electrical stimulus in response to incident light received at the first photovoltaic element; and

adjusting the electrical stimulus via the second photovoltaic element.

8. The method of claim 7, further comprising:

applying the adjusted electrical stimulus to at least a portion of a retina.

9. The method of claim 7, wherein adjusting the electrical stimulus comprises:

passing a portion of the incident light through the first photovoltaic element and receiving the portion of incident light at the second photovoltaic element, wherein the second photovoltaic element adjusts the electrical stimulus in response to the portion of incident light.

10. The method of claim 7, wherein generating the electrical stimulus comprises filtering out all but a predetermined wavelength range of incident light at the first photovoltaic element and generating a voltage in response to receipt of the predetermined wavelength range.

11. The method of claim 10, wherein the predetermined wavelength range of incident light comprises a wavelength range of visible light.

12. The method of claim 10, wherein the predetermined wavelength range of incident light comprises a wavelength range of infrared light.

13. The method of claim 10, wherein filtering out all but a predetermined wavelength range comprises:

filtering out all but a first portion of the predetermined wavelength range of incident light over a first region of the first photovoltaic element;

filtering out all but a second portion of the predetermined wavelength range of incident light over a second region of the first photovoltaic element;
generating a first voltage at the first region in response to receipt of the first portion of the predetermined wavelength range of incident light; and
generating a second voltage at the second region in response to receipt of the second portion of the predetermined wavelength range of incident light.

14. The method of claim 7, wherein adjusting the electrical stimulus comprises:

filtering out all but a portion of a wavelength range of incident light at the second photovoltaic element; and

adjusting the electrical stimulus via the second photovoltaic element in response to receipt of the portion of the wavelength range of incident light at the second photovoltaic element.

15. The method of claim 13 wherein the first portion of the predetermined wavelength range of incident light comprises infrared light.

16. The method of claim 7, further comprising transmitting at least a portion of the incident light upon at least one of the first photovoltaic element and the second photovoltaic element from an external illumination system.

17. The method of claim 16, further comprising varying a wavelength balance of the at least a portion of incident light transmitted by the external illumination system.

18. The method of claim 16, further comprising varying intensity of the at least a portion of the incident light transmitted by the external illumination system.

19. A method of providing electrical stimulation to a retina of an eye, the method comprising:

illuminating a first photovoltaic element with a first wavelength range of incident light from a portable illumination source;
generating an electrical stimulus at the first photovoltaic element in response to the first wavelength of incident light;
illuminating a second photovoltaic element with a second wavelength range of incident light from the portable illumination source; and
adjusting a gain of the electrical stimulus with the second photovoltaic element in response to the second wavelength range of incident light.

20. A method of providing electrical stimulation to a retina of an eye, the method comprising:

generating a positive electrical potential at a first photovoltaic element in response to a first wavelength range of incident light;

generating a negative electrical potential at a second photovoltaic element in response to a second wavelength range of incident light;

adjusting the positive electrical potential via a third photovoltaic element in electrical communication with the first photovoltaic element in response to a third wavelength range of incident light to generate a first enhanced electrical potential;

adjusting the negative electrical potential via a fourth photovoltaic element in electrical communication with the second photovoltaic element in response to the third wavelength range of incident light to generate a second enhanced electrical potential; and

applying the first and second enhanced electrical potentials to the retina.

21. The method of claim 21, wherein the first and second enhanced electrical potentials are applied to the retina from within the eye.